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WHAT IS CLAIMED IS:

5 1. An expression cassette comprising a promoter operably linked to a heterologous polynucleotide sequence, or a complement thereof, encoding a LEC1 polypeptide, comprising a subsequence at least 68% identical to the B domain of SEQ ID NO:2, wherein the polynucleotide sequence is heterologous to any element in the expression cassette.

10 2. The expression cassette of claim 1, wherein the B domain comprises a polypeptide sequence between about amino acid residue 28 and about residue 117 of SEQ ID NO:2.

3. The expression cassette of claim 1, wherein the B domain comprises a polypeptide sequence with an amino terminus at amino acid residues 28-35 and a carboxy terminus at amino acid residues 103-117 of SEQ ID NO:2.

15 4. The expression cassette of claim 1, wherein the LEC1 polypeptide is SEQ ID NO: 20.

5. The expression cassette of claim 4, wherein the polynucleotide sequence is SEQ ID NO:19.

6. The expression cassette of claim 1, wherein the polynucleotide sequence encodes a fusion between two or more LEC1 polypeptides or polypeptide subsequences.

20 7. The expression cassette of claim 1, wherein the LEC1 polypeptide is SEQ ID NO: 22.

8. The expression cassette of claim 6, wherein the polynucleotide sequence is SEQ ID NO:21.

25 9. The expression cassette of claim 1, wherein the promoter is a constitutive promoter.

10. The expression cassette of claim 1, wherein the promoter is from a LEC1 gene.

11. The expression cassette of claim 10, wherein the promoter comprises from about nucleotide 1 to about nucleotide 1998 of SEQ ID NO:3.

30 12. The expression cassette of claim 10, wherein the promoter comprises SEQ ID NO:23.

13. The expression cassette of claim 12, wherein the promoter further comprises SEQ ID NO:24.

14. The expression cassette of claim 1, wherein the polynucleotide sequence is linked to the promoter in an antisense orientation.

15. An expression cassette comprising a promoter operably linked to a heterologous polynucleotide sequence, or a complement thereof, encoding a LEC1 polypeptide comprising a subsequence at least 90% identical to the A or C domain of a LEC1 polypeptide, wherein the polynucleotide sequence is heterologous to any element in the expression cassette.

16. The expression cassette of claim 15, wherein the polynucleotide encodes a fusion between two or more LEC1 polypeptides or polypeptide subsequences.

10 17. An expression cassette for the expression of a heterologous polynucleotide in a plant cell, wherein the expression cassette comprises a promoter polynucleotide at least 70% identical to SEQ ID NO:23 and wherein the promoter polynucleotide is operably linked to a heterologous polynucleotide.

15 18. The expression cassette of claim 17, wherein the promoter comprises SEQ ID NO:23.

19. The expression cassette of claim 17, wherein the promoter further comprises a polynucleotide at least 70% identical to SEQ ID NO:24.

20. The expression cassette of claim 19, wherein the promoter comprises SEQ ID NO:24.

20 21. An isolated nucleic acid or complement thereof, encoding a LEC1 polypeptide comprising a subsequence at least 68% identical to the B domain of SEQ ID NO:2, with the proviso that the nucleic acid is not clone MNJ7.

25 22. The isolated nucleic acid of claim 21, wherein the B domain comprises a polypeptide sequence with an amino terminus at amino acids 28-35 and a carboxy terminus at amino acids 103-117 of SEQ ID NO:2.

23. The isolated nucleic acid of claim 21, wherein the LEC1 polypeptide is SEQ ID NO: 20.

24. The isolated nucleic acid of claim 23, wherein the polynucleotide sequence is SEQ ID NO:19.

30 25. The isolated nucleic acid of claim 21, wherein the nucleic acid encodes a fusion between two or more LEC1 polypeptides or polypeptide subsequences.

26. The isolated nucleic acid of claim 21, wherein the LEC1 polypeptide is SEQ ID NO: 22.

27. The isolated nucleic acid of claim 26, wherein the polynucleotide sequence is SEQ ID NO:21.

28. The isolated nucleic acid of claim 21, wherein the nucleic acid further comprises a promoter operably linked to the LEC1-encoding nucleic acid.

5 29. The isolated nucleic acid of claim 29, wherein the promoter is a constitutive promoter.

30. The isolated nucleic acid of claim 29, wherein the plant promoter is from a LEC1 gene.

10 31. The isolated nucleic acid of claim 30, wherein the promoter comprises from about nucleotide 1 to about nucleotide 1998 of SEQ ID NO:3.

32. The isolated nucleic acid of claim 30, wherein the promoter comprises SEQ ID NO:23.

33. The isolated nucleic acid of claim 32, wherein the promoter further comprises SEQ ID NO:24.

15 34. The isolated nucleic acid of claim 21, wherein the polynucleotide sequence is linked to the promoter in an antisense orientation.

35. A host cell comprising an expression cassette according to any of claims 1, 15 and 17 or a nucleic acid molecule according to claim 21, wherein the expression cassette or nucleic acid molecule is flanked by heterologous sequence.

20 36. The host cell of claim 35, comprising an expression cassette of claim 1.

37. The host cell of claim 35, comprising an expression cassette of claim 15.

38. The host cell of claim 35, comprising an expression cassette of claim 17.

39. The host cell of claim 35, comprising a nucleic acid molecule of claim 21.

40. An isolated polypeptide comprising an amino acid sequence

25 (a) at least 68% identical to the B domain of SEQ ID NO:2; and

(b) capable of exhibiting at least one of the biological activities of the polypeptide encoded by SEQ ID NO:1, SEQ ID NO: 19 or SEQ ID NO:21, or a fragment thereof.

41. An antibody capable of binding the isolated polypeptide of claim 40.

42. A method of introducing an isolated nucleic acid into a host cell

30 comprising:

(a) providing an expression cassette according to any of claims 1, 15 and 17 or an isolated nucleic acid according to claim 21; and

(b) contacting the expression cassette or nucleic acid with the host cell under conditions that permit insertion of the nucleic acid into the host cell.

- 43. The method of claim 42, providing the expression cassette of claim 1.
- 44. The method of claim 42, providing the expression cassette of claim 15.
- 45. The method of claim 42, providing the expression cassette of claim 17.
- 46. The method of claim 42, providing the nucleic acid of claim 21.

5 47. A method of modulating transcription, the method comprising,
introducing into the plant an expression cassette containing a plant promoter operably
linked to a heterologous *LEC1* polynucleotide, the heterologous *LEC1* polynucleotide
encoding a LEC1 polypeptide comprising a subsequence at least 68% identical to the B
domain of SEQ ID NO:2; and
10 detecting a plant with modulated transcription.

48. The method of claim 47, wherein the LEC1 polynucleotide encodes SEQ
ID NO:2.

49. The method of claim 48, wherein the LEC1 polynucleotide is SEQ ID
NO:1.

15 50. The method of claim 47, wherein the LEC1 polynucleotide encodes SEQ
ID NO:20.

51. The method of claim 50, wherein the LEC1 polynucleotide is SEQ ID
NO:19.

20 52. The method of claim 47, wherein the LEC1 polynucleotide encodes SEQ
ID NO:22.

53. The method of claim 52, wherein the LEC1 polynucleotide is SEQ ID
NO:21.

54. The method of claim 47, wherein modulating transcription results in the
induction of embryonic characteristics in a plant.

25 55. The method of claim 47, wherein modulating transcription results in the
induction of seed development

56. A method of detecting a nucleic acid in a sample, comprising

- (a) providing an isolated nucleic acid molecule according to claim 21;
- (b) contacting the isolated nucleic acid molecule with a sample under conditions

30 which permit a comparison of the sequence of the isolated nucleic acid molecule with the
sequence of DNA in the sample; and

- (c) analyzing the result of the comparison.

57. The method of claim 56, wherein the isolated nucleic acid molecule and the sample are contacted under conditions which permit the formation of a duplex between complementary nucleic acid sequences.

58. A transgenic plant cell or transgenic plant comprising the recombinant expression cassette of claim 1.

59. The transgenic plant cell or transgenic plant of claim 58, wherein the LEC1 polypeptide is SEQ ID NO:20.

60. The transgenic plant cell or transgenic plant of claim 59, wherein the polynucleotide sequence is SEQ ID NO:19.

61. The transgenic plant cell or transgenic plant of claim 58, wherein the LEC1 polypeptide is SEQ ID NO:22.

62. The transgenic plant cell or transgenic plant of claim 61, wherein the polynucleotide sequence is SEQ ID NO:21.

63. The transgenic plant cell or transgenic plant of claim 58, wherein the promoter is a constitutive promoter.

64. The transgenic plant cell or transgenic plant of claim 58, wherein the promoter comprises a promoter from a LEC1 gene.

65. The transgenic plant cell or transgenic plant of claim 58, wherein the polynucleotide sequence is linked to the promoter in an antisense orientation.

66. The transgenic plant cell or transgenic plant of claim 64, wherein the promoter comprises from about nucleotide 1 to about nucleotide 1998 of SEQ ID NO:3.

67. The transgenic plant cell or transgenic plant of claim 64, wherein the promoter comprises SEQ ID NO:23.

68. The transgenic plant cell or transgenic plant of claim 67, wherein the promoter further comprises SEQ ID NO:24.

69. A plant which has been regenerated from a plant cell according to 58.

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